Title: Heuristic for an Emergency Alert Protocol (HELP !)

Team Name: The Ad-Hoc Ninjas (Group - 3)

Team Members: Kriti Agrawal, Marcus Miguez, and David Moore

Abstract:

In case of an emergency, there is a preeminent need to provide a communication system that can facilitate secure and efficient transmission of information. Thus, an emergency responder system must be able to handle scenarios where the cellular infrastructure is flooded by user traffic, and immune to manipulation of information by malicious entities present in the network. The existing approaches offer solution in the form of ad-hoc networks via Bluetooth and/or WiFi. Due to the lack of infrastructure in an ad-hoc network, the primary concerns arising from this solution are the issues of optimizing packet transmission over a multihop route along with the provision of encryption mechanisms to ensure security of user’s information and managing trust in a heterogeneous node environment.

We are hoping to develop a mobile ad-hoc routing protocol which will address the issue of routing a distress signal to an authoritative figure in a time-efficient manner with high success ratio. The proposed routing protocol will attempt to address the issues of both routing and security/trust through the use of roles, where each node in the ad-hoc network will be labeled as either a civilian node or an authoritative node. The nodes contain information about its role, unique ID, position, score based neighboring nodes and an array of type node which contains the references of up to seven neighbors. The packet relayed between different links in the network contains the message to be transmitted along with the nodeID of the sender node. On calculation of score and distance between two nodes, a packet containing the distress message is created, which is then routed to the node with the score corresponding to the authoritative node. On reaching the authoritative node, the information about the packet is printed to the screen. We also try to check the efficiency of the routing protocol by building upon the existing static analysis of nodes randomly located in a plane and introducing mobility of the nodes, making the simulation more realistic.

Future Work:

We hope to consider including mechanisms for packet failure or packet loss as well as account for congestion avoidance.

References:


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